

**INDEPENDENT RELEASE VERIFICATION AND
VALIDATION PLAN (IRVVP)
ECS RELEASE A**

Preliminary
(Deliverable 0601/Rel. A)

March 31, 1995

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ECS RELEASE A**

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1. Introduction

1.1 Purpose

The purpose of this Independent Release Verification and Validation Plan (IRVVP) for the EOSDIS Core System (ECS) Release A is to document:

1. The organizational relationships between IV&V and the ESDIS Project and ECS developer, Hughes Applied Information Systems (HAIS),
2. The results of an ECS Release A Criticality Analysis and Risk Assessment (CARA),
3. The ECS Release A specific IV&V level-of-effort activities to be performed,
4. The programmatic aspects of the EOSDIS IV&V ECS Release A development analysis effort (schedule and resource allocation), and
5. The reporting mechanisms to be employed.

Section 2 documents the organizational relationships and CARA results. Section 3 documents the life cycle dependent activities. Appendices A and B document the programmatic aspects of the effort. Appendix C documents the reporting mechanisms.

1.2 Scope

The current IRVVP scope of IV&V analyses of the ECS Release A is as follows:

- Perform an ECS design technical integrity analysis (traceability, quality, testability) and generate both a Preliminary and Final Design Evaluation Technical Analysis Reports (TAR). The preliminary report will be produced three months after ECS Release A Preliminary Design Review (PDR) while the final will be delivered two months before ECS Release A Critical Design Review (CDR). The analysis is limited to those design elements supporting ECS Release A. Traceability will be analyzed between the level 4 requirements and design elements; quality and testability will be analyzed.
- Prepare to participate in ECS Release A CDR activities by reviewing documentation and attending the scheduled presentations. The IV&V Team will then submit Review Item Discrepancies (RIDs) against the applicable documentation.

The scope of the ECS Release A IRVVP will expand to include other life cycle activities with the final release of this plan.

1.3 ECS Release A Capability Overview

ECS Release A consists of capabilities which support the TRMM mission, Landsat 7 early interface testing, EOS AM-1 interface testing as well as interoperability with EOSDIS Version 0 (V0). For the TRMM mission, ECS provides additional data processing, ingest

and archival services at the Langley Research Center (LaRC), Marshall Space Flight Center (MSFC), and the Goddard Space Flight Center (GSFC) for L0 through L4 data products, and provides access to archived data. For Landsat 7 early interface testing, the ECS provides the basic ingest services for L0R data at the EDC DACC. To support the EOS AM-1 interface testing, the ECS provides the core flight operations infrastructure to interface with the AM-1 spacecraft. To support the interoperability of V0 and V1, the ECS provides the services to allow V0 users to access V1 data, and vice versa.

2. Lifecycle Phase Independent Activity

Life cycle phase independent IV&V activities for ECS Release A are those whose execution is independent of the particular life cycle phase in which they are performed. This section addresses the organizational interfaces and mechanisms, Criticality Analysis and Risk Assessment (CARA), documentation reviews, and formal review support for ECS Release A.

2.1 Organizational Interfaces and Mechanisms

HAIS is currently conducting a major reorganization which changes their organizational focus from ECS segments to ECS releases. This reorganization may also have an effect on the IV&V Team's day-to-day interfaces to the ESDIS Project. Until the process is complete (currently very late March to early April 1995) it is not practical to define IV&V interfaces and mechanisms. This IRVVP will be updated when HAIS's organizational realignment is complete, to describe the most effective IV&V-to-ESDIS/HAIS interfaces.

The EOSDIS IV&V Team has requested and has received approval for an on-site (HAIS) presence to facilitate communication and access to information. This IRVVP will be updated when the details are complete and will describe how on-site interaction will be conducted.

2.2 Criticality Analysis and Risk Assessment (CARA)

One of the initial steps in planning and allocating IV&V resources to a release effort is to perform a Criticality Analysis and Risk Assessment (CARA) study. The outcome of the study allows the IV&V team to assign priorities to the various release components and thus ensures that the most critical areas receive adequate coverage. Section 2.2 of the Independent System Verification and Validation Plan (ISVVP) [2] details the methodology for performing a CARA.

A CARA effort will be performed for ECS Release A and the results will be documented in the final version of this IRVVP. One major difference between the CARA for IR-1 versus Release A will be the inclusion of Flight Operations Segment (FOS) components during the analysis. This will be reflected in the CARA results, as critical spacecraft operations functions are evaluated in criticality and risk along with science end user capabilities. In the interim, the IV&V Team will use the IR-1 CARA results to assist in focusing the Release A SDPS and CSMS development analysis.

2.3 Formal Review Support

Formal review support, as defined in Section 2.6 of the ISVVP [2], involves participation of the IV&V Team in major program milestones such as Preliminary Design Review, Critical Design Review, and others. It is the task of the IV&V Team to evaluate the

products associated with a certain review along with related studies and in turn provide a comprehensive evaluation of the program at a certain milestone. Specific goals associated with each milestone are documented in Section 2.6 of the ISVVP [2].

The following are the major reviews associated with ECS Release A that will be supported by the IV&V Team:

- Critical Design Review 1 August 1995
- Test Readiness Review (TRR) 1 April 1996 (Final Review in Series)
- Element Test Review (ETR) 1 June 1996 (Final Review in Series)
- Consent to Ship Review (CSR) 1 October 1996
- Release Readiness Review (RRR) 1 December 1996.

The IV&V Team will attend these reviews and submit Review Item Discrepancies (RIDs) as required. Evaluations of supporting documentation will be reported through the Technical Analysis Memoranda (TAM) vehicle described in Appendix C.

2.4 Documentation Review

EOSDIS software documentation reviews are conducted to observe measurable progress in the software completion process by reviewing and analyzing contractor delivered software documentation. Section 2.5 of the ISVVP [2] describes the goals and approach for performing such reviews.

Documentation review of ECS Release A deliverables will be prioritize according to the results of the CARA study. Again, this will allow the IV&V Team to focus on those parts of the system which are highly critical to the success of the program. The final version of this IRVVP will contain a list of tentative documents for review. Documents to be reviewed would mainly fall within the following categories: training manuals, prototype studies, formal presentations, and ad hoc reports. The IV&V Team would then publish these evaluations using the Technical Analysis Memoranda (TAM) vehicle described in Appendix C.

3. Lifecycle Phase Dependent Activities

Life cycle phase dependent activities are those performed during specific phases of the ECS development life cycle. The following are the major ECS Release A activities as defined in the ISVVP:

- Design Evaluation
- Software Development Evaluation
- Implementation Evaluation
- Testing Evaluation
- Installation and Checkout Evaluation
- Operations and Maintenance Evaluation.

Only Design Evaluation will be addressed as part of this Preliminary IRVVP for ECS Release A.

3.1 Design Evaluation

Design evaluation consists of examining both the process in which the contractor produced the design for ECS Release A and the actual products generated by the effort.

3.1.1 Design Process Evaluation

ECS Release A Design Process Evaluation focuses on how the HAIS design process is implemented to produce quality design products on a timely basis. The evaluation examines the design process programmatic (plans, schedules, organization, resource allocation efficacy, personnel capabilities, etc.) and environments (standards, tools, data bases, etc.) to assess the likelihood that the process will (continue to) yield the required design phase end-products. In addition, the evaluation examines the design process *post facto* to identify where the process may have failed and what could be done to improve it for later-release design phases. In this context, IV&V will analyze the design process related documents shown in Exhibit 3-1, conduct hands-on evaluation of the HAIS design environment and tooling, conduct informal interviews with HAIS personnel, and research the literature to identify comparable design efforts which could be used to support predictions of success or failure. The results of these evaluations will be documented in the Technical Analysis Report (TAR) or less formally in the Technical Analysis Memorandum (TAM) as listed in Exhibit 3-1.

Developer Product or Process	Evaluation Process [1]IVVMP; [2]ISVVP	IVV and Other Products Utilized	IVV Outputs
ECS Systems Engineering Plan 201/SE1	TBD		0602/ Rel A Prelim., 0609/ Rel A Final
Methodology for Definition of External Interface 208/SE1	TBD		0602/ Rel A Prelim., 0609/ Rel A Final
Performance Assurance Implementation Plan 501/PA1	TBD		0602/ Rel A Prelim., 0609/ Rel A Final
CSMS Segment Release Plan 307/DV2	TBD		0602/ Rel A Prelim., 0609/ Rel A Final
CSMS Prototyping and Studies Plan 317/DV1	TBD		0602/ Rel A Prelim., 0609/ Rel A Final
CSMS Prototyping and Studies Progress Plan 318/DV3	TBD		0602/ Rel A Prelim., 0609/ Rel A Final
SDPS Segment Release Plan 307/DV2	TBD		0602/ Rel A Prelim., 0609/ Rel A Final
SDPS Prototyping and Studies Plan 317/DV1	TBD		0602/ Rel A Prelim., 0609/ Rel A Final
SDPS Prototyping and Studies Progress Plan 318/DV3	TBD		0602/ Rel A Prelim., 0609/ Rel A Final

EXHIBIT 3-1: ECS Products For Review During Design Process Evaluation**3.1.2 Design Product Evaluation**

As part of the Design Evaluation phase, the IV&V Team will review various products provided by the ECS contractor. These products will be reviewed and analyzed using processes described in the ISVVP. For ECS Release A, the products will generated

during periods around the Preliminary Design Review (PDR) and the Critical Design Review (CDR). Exhibit 3-2 lists the products to be analyzed as part of both PDR and CDR, a reference to the associated review process, and a reference to the Technical Analysis Report (TAR) documenting the results.

Developer Product or Process	Evaluation Process [1]IVVMP; [2]ISVVP	IVV and Other Products Utilized	IVV Outputs
CSMS Design Specification 305/DV3	[2] 3.3.2	CSMS Requirements Specification 304/DV1 CSMS Operations Scenarios 605/OP2	0602/REL A Prelim. 0609/REL A Final
CSMS Database Design & Database Schema Specifications 311/DV1	[2]3.4.3	CSMS Requirements Specification 304/DV1 CSMS Operations Scenarios 605/OP2	0602/REL A Prelim. 0609/REL A Final
FOS Design Specification 305/DV2	[2] 3.3.2	FOS Requirements Specification 304/DV1 FOS Operations Scenarios 605/OP2	0602/REL A Prelim. 0609/REL A Final
FOS Database Design and Schema Specifications 311/DV3	[2]3.4.3	FOS Requirements Specification 304/DV1 FOS Operations Scenarios 605/OP2	0602/REL A Prelim. 0609/REL A Final
SDPS Design Specification 305/DV3	[2]3.3.2	SDPS Requirements Specification 304/DV1 SDPS Operations Scenarios 605/OP2	0602/REL A Prelim. 0609/REL A Final
SDPS Database Design & Database Schema Specifications 311/DV1	[2]3.4.3	SDPS Requirements Specification 304/DV1 SDPS Operations Scenarios 605/OP2	0602/REL A Prelim. 0609/REL A Final

EXHIBIT 3-2: ECS PDR/CDR Related Products For Review During Design Product Evaluation

3.2 Software Development Evaluation

Software development evaluation consists of the IV&V Team analyzing the environment and procedures utilized by the ECS contractor during unit and system development. In addition, the specific components are evaluated against the applicable requirements, standards, and methodologies.

3.2.1 Development Process Evaluation

The Release A development process will be evaluated based on TBD criteria which will be discussed in the Final IRVVP for Release A, deliverable 0608.

3.2.2 Development Product Evaluation

As work towards the development of ECS Release A continues, the IV&V Team will concentrate on reviewing the components of the system being produced by the contractor. Release A will be the first delivery containing components belonging to the Flight Operations Segment (FOS). As in the design phase, all the ECS segment components will be reviewed and analyzed using processes described in the ISVVP. For ECS Release A, the development products will analyzed during the period between Critical Design Review (CDR) and the Test Readiness Review (TRR). The next release of this IRVVP will contain an exhibit TBD listing the products to be evaluated during this phase.

3.3 Implementation Test Evaluation

Implementation test evaluation requires that the IV&V Team analyze the process and procedures for testing the ECS Release A, monitor the actual testing activities, and evaluate the results provided by the ECS developer. These activities will be performed between Test Readiness Review (TRR) and Element Test Review for Segment I&T and between TRR and Consent to Ship Review (CSR) for System I&T.

3.3.1 Implementation Test Process Evaluation

The Release A implementation test process will be evaluated based on TBD criteria which will be discussed in the updated IRVVP for Release A, deliverable 0608.

3.3.2 Implementation Test Product Evaluation

During the implementation of ECS Release A, the IV&V Team will focus on reviewing the associated segment and system integration and test plans, monitoring tests, and once executed, analyzing the test results. Again, implementation activities will follow the procedures and guidelines provided in the ISVVP. For ECS Release A, the results of the Functional Threads (FTs), both at the Segment and System Levels will be analyzed during the period between the Test Readiness Review (TRR) and the Consent to Ship Review (CSR). The next release of this IRVVP will contain an exhibit TBD listing the products to be evaluated during this phase.

Appendix A: Task Activity Schedule

The following page contains an inserted schedule which summarizes the activities and deliverables associated with the development analysis of ECS Release A. Major deliverables and approximate duration of associated subtasks are shown. Normally, Task 6 IV&V activities will center around major program milestones. The milestones that have been identified for ECS Release A are as follows:

- Critical Design Review 1 August 1995
- Test Readiness Review (TRR) 1 April 1996 (Final Review in Series)
- Element Test Review (ETR) 1 June 1996 (Final Review in Series)
- Consent to Ship Review (CSR) 1 October 1996
- Release Readiness Review (RRR) 1 December 1996

The guidelines for the ECS Release A Deliverables are as follows:

Deliverable	Document ID	Date Required
Independent Release Verification and Validation Plan (IRVVP), <i>Preliminary</i>	0601/REL A Preliminary	Task 6 (Start) + 2 Months
Independent Release Verification and Validation Plan (IRVVP), <i>Final</i>	0601/REL A Final	ECS Rel A CDR + 2 Months
Design Evaluation TAR, <i>Preliminary</i>	0602/REL A Preliminary	ECS Release A PDR + 3 Months
Design Evaluation TAR, <i>Final</i>	0602/REL A Final	ECS Release A CDR + 2 Months
Software Development Evaluation TAR, <i>Preliminary</i>	0604/REL A Preliminary	ECS Release A TRR - 3 Months
Software Development Evaluation TAR, <i>Final</i>	TBD Final	TBD
Test Plans/Procedures Evaluation TAR, <i>Preliminary</i>	TBD Preliminary	TBD
Test Plans/Procedures Evaluation TAR, <i>Update</i>	TBD Update	TBD
Test Plans/Procedures Evaluation TAR, <i>Final</i>	TBD Final	TBD
Test Results Evaluation TAR, <i>Preliminary</i>	TBD Preliminary	TBD
Test Results Evaluation TAR, <i>Update</i>	TBD Update	TBD
Test Results Evaluation TAR, <i>Final</i>	TBD Final	TBD

Appendix B: Task Resource Allocation

The following labor categories have been allocated to the Development Analysis of the ECS Release A:

- Senior Systems Engineer
- Systems Engineer
- Clerical Support.

Exhibit B-1 details the planned allocation of resources per month and per labor category for Task 6, along with the total amount allocated to Release A activities.

	1995											1996
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Sr. Systems Engineer	0.45	0.80	1.50	1.50	1.25	1.25	1.80	1.85	1.85	1.85	1.85	3.10
Systems Engineer	0.20	0.10	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.35	0.35	1.65
Clerical	0.05	0.10	0.00	0.15	--	--	0.25	--	0.40	--	0.25	--
Total Allocation to Rel. A Activities	0.70	1.00	2.10	2.25	1.85	1.85	2.65	2.45	2.85	2.20	2.45	4.75

Appendix C: Technical Analysis Report (TAR) Formats

This appendix describes the format for each class of Technical Analysis Report (TAR) generated during the EOSDIS IV&V ECS Release A Development Analysis:

- EOSDIS IV&V Design Evaluation TAR
- EOSDIS IV&V Software Development Evaluation TAR
- EOSDIS IV&V Implementation Test Planning Evaluation TAR
- EOSDIS IV&V Implementation Test Results Evaluation TAR
- EOSDIS IV&V Technical Analysis Memorandum (TAM)

The EOSDIS IV&V Technical Analysis Memoranda (TAM's) are not formal deliveries. TAM's are generated on an *ad hoc* basis to facilitate early Project visibility into important issues. The TAM format is illustrated on page C-10. TAR's are formal deliveries. Exhibit C-1 allocates each formal deliverable, within the scope of this IRVVP, to the applicable TAR format.

Deliverable#	Deliverable Name	TAR Format Page
0602 Prelim. 0609 Final	Design Evaluation TAR (Release A) (Preliminary/Final)	C-2
0611 Prelim. TBD Final	S/W Development Eval TAR (Release A) (Preliminary/Final)	C-4
TBD	Test Plans/Proc Eval TAR (Release A) (Preliminary/Update/Final)	C-6
TBD	Test Result Evaluation TAR (Release A) (Preliminary/Update/Final)	C-8

EXHIBIT C-1: Deliverable Allocation to TAR Format

Where TAR page limitations are specified, the word 'goal' should be interpreted to mean: less than or equal to that page count, if possible. The intent is to create hierarchical documents (executive summary, report body, appendices - in increasing order of detail) readily useable by varying management/engineering levels of readership interest.

EOSDIS IV&V Design Evaluation TAR Format

- 1.0 EXECUTIVE SUMMARY [goal: 2 pgs]
- 2.0 INTRODUCTION [goal: 3 pgs]
 - 2.1 Purpose of the Report
 - 2.2 Objective of the Analysis
 - 2.3 Scope of the Analysis
 - 2.4 Background Information
- 3.0 ANALYSIS TASKS PERFORMED [goal: 5 pgs]
 - 3.1 Design Process Evaluation
 - 3.2 Configuration Item Evaluation
 - 3.3 Design Object Evaluation
 - 3.4 Constraints Affecting the Analysis
- 4.0 ANALYSIS RESULTS [goal: 20 pgs]
 - 4.1 Design Process Evaluation Results
 - 4.1.1 Discussion of Analysis Results
 - 4.1.2 Identified Problems
 - 4.1.3 Potential Issues
 - 4.2 Configuration Item Evaluation Results
 - 4.2.1 Discussion of Analysis Results
 - 4.2.2 Identified Problems
 - 4.2.2.1 Traceability
 - 4.2.2.2 Quality
 - 4.2.2.3 Testability
 - 4.2.3 Potential Issues
 - 4.3 Design Object Evaluation Results
 - 4.3.1 Discussion of Analysis Results
 - 4.3.2 Identified Problems
 - 4.3.2.1 Traceability
 - 4.3.2.2 Quality
 - 4.3.2.3 Testability
 - 4.3.3 Potential Issues
- 5.0 CONCLUSIONS [goal: 7 pgs]
 - 5.1 Technical Integrity
 - 5.1.1 Design Process
 - 5.1.2 Design Products
 - 5.2 User Satisfaction
 - 5.3 Trends and Projections

6.0 RECOMMENDATIONS [goal: 3 pgs]

- 6.1 Areas Requiring Further Analysis
- 6.2 Recommended Solutions to Important Problems
- 6.3 Risk Management Recommendations

APPENDICES

- A: ECS Release A Design Allocation
- B: EOSDIS IV&V Design Evaluation Guidelines
- C: Design Process Evaluation Details
- D: Design Product Evaluation Details
 - D.1: Configuration Item Evaluation Details
 - D.2: Design Object Evaluation Details
- E: Associated EOSDIS IV&V Technical Analysis Memoranda
- F: List of References
- G: Tools and Data Bases Utilized

EOSDIS IV&V Software Development Evaluation TAR Format

- 1.0 EXECUTIVE SUMMARY [goal: 2 pgs]
- 2.0 INTRODUCTION [goal: 3 pgs]
 - 2.1 Purpose of the Report
 - 2.2 Objective of the Analysis
 - 2.3 Scope of the Analysis
 - 2.4 Background Information
- 3.0 ANALYSIS TASKS PERFORMED [goal: 5 pgs]
 - 3.1 Software Development Process Evaluation
 - 3.2 Software Development Product Evaluation
 - 3.3 Constraints Affecting the Analysis
- 4.0 ANALYSIS RESULTS [goal: 20 pgs]
 - 4.1 Software Development Process Evaluation Results
 - 4.1.1 Discussion of Analysis Results
 - 4.1.2 Identified Problems
 - 4.1.3 Potential Issues
 - 4.2 Software Development Product Evaluation Results
 - 4.2.1 Discussion of Analysis Results
 - 4.2.2 Identified Problems
 - 4.2.2.1 Traceability
 - 4.2.2.2 Quality
 - 4.2.2.3 Testability
 - 4.2.3 Potential Issues
- 5.0 CONCLUSIONS [goal: 7 pgs]
 - 5.1 Technical Integrity
 - 5.1.1 Software Development Process
 - 5.1.2 Software Development Products
 - 5.2 User Satisfaction
 - 5.3 Trends and Projections
- 6.0 RECOMMENDATIONS [goal: 3 pgs]
 - 6.1 Areas Requiring Further Analysis
 - 6.2 Recommended Solutions to Important Problems
 - 6.3 Risk Management Recommendations

APPENDICES

- A: ECS Release A Software Allocation
- B: EOSDIS IV&V Software Development Evaluation Guidelines
- C: Software Development Process Evaluation Details
- D: Software Development Product Evaluation Details
- E: Associated EOSDIS IV&V Technical Analysis Memoranda
- F: List of References
- G: Tools and Data Bases Utilized

EOSDIS IV&V Implementation Test Planning Evaluation TAR Format

- 1.0 EXECUTIVE SUMMARY [goal: 2 pgs]
- 2.0 INTRODUCTION [goal: 3 pgs]
 - 2.1 Purpose of the Report
 - 2.2 Objective of the Analysis
 - 2.3 Scope of the Analysis
 - 2.4 Background Information
- 3.0 ANALYSIS TASKS PERFORMED [goal: 5 pgs]
 - 3.1 Developer Testing Process Evaluation
 - 3.2 Developer Test Plans Evaluation
 - 3.3 Constraints Affecting the Analysis
- 4.0 ANALYSIS RESULTS [goal: 20 pgs]
 - 4.1 Developer Testing Process Evaluation Results
 - 4.1.1 Discussion of Analysis Results
 - 4.1.2 Identified Problems
 - 4.1.3 Potential Issues
 - 4.x Developer *test_type* Test Plans Evaluation Results
 - 4.x.1 Discussion of Analysis Results
 - 4.x.2 Identified Problems
 - 4.x.2.1 Traceability
 - 4.x.2.2 Quality
 - 4.x.3 Potential Issues
- 5.0 CONCLUSIONS [goal: 7 pgs]
 - 5.1 Technical Integrity
 - 5.1.1 Developer Testing Process
 - 5.1.2 Developer Test Plans
 - 5.2 User Satisfaction
 - 5.3 Trends and Projections
- 6.0 RECOMMENDATIONS [goal: 3 pgs]
 - 6.1 Areas Requiring Further Analysis
 - 6.2 Recommended Solutions to Important Problems
 - 6.3 Risk Management Recommendations

APPENDICES

- A: ECS Release A Functional Thread and Test Allocation
- B: EOSDIS IV&V Developer Testing Evaluation Guidelines
- C: Developer Testing Process Evaluation Details
- D: Developer Test Plans Evaluation Details
 - D.x: Developer *test_type* Test Plans Evaluation Details
- E: Associated EOSDIS IV&V Technical Analysis Memoranda
- F: List of References
- G: Tools and Data Bases Utilized

Note:

- x*: 1, 2, 3, etc. As needed to discuss all *test_types* addressed in TAR.
- test_type*: Pre-Integration, Segment Integration, System Integration, Acceptance.

EOSDIS IV&V Implementation Test Results Evaluation TAR Format

- 1.0 EXECUTIVE SUMMARY [goal: 2 pgs]
- 2.0 INTRODUCTION [goal: 3 pgs]
 - 2.1 Purpose of the Report
 - 2.2 Objective of the Analysis
 - 2.3 Scope of the Analysis
 - 2.4 Background Information
- 3.0 ANALYSIS TASKS PERFORMED [goal: 5 pgs]
 - 3.1 Developer Test Execution Process Evaluation
 - 3.3 Developer Test Execution Results Evaluation
 - 3.4 Constraints Affecting the Analysis
- 4.0 ANALYSIS RESULTS [goal: 20 pgs]
 - 4.1 Developer Test Execution Process Evaluation
 - 4.1.1 Discussion of Analysis Results
 - 4.1.2 Identified Problems
 - 4.1.3 Potential Issues
 - 4.x Developer *test_type* Test Execution Results Evaluation
 - 4.x.1 Discussion of Analysis Results
 - 4.x.2 Identified Problems
 - 4.x.3 Potential Issues
- 5.0 CONCLUSIONS [goal: 7 pgs]
 - 5.1 Technical Integrity
 - 5.1.1 Developer Test Execution Process
 - 5.1.2 Developer Test Execution Results
 - 5.2 User Satisfaction
 - 5.3 Trends and Projections
- 6.0 RECOMMENDATIONS [goal: 3 pgs]
 - 6.1 Areas Requiring Further Analysis
 - 6.2 Recommended Solutions to Important Problems
 - 6.3 Risk Management Recommendations

APPENDICES

- A: ECS Release A Functional Thread and Test Allocation
- B: EOSDIS IV&V Developer Test Results Evaluation Guidelines
- C: Developer Test Execution Process Evaluation Details
- D: Developer Test Execution Results Evaluation Details
 - D.x: Developer *test_type* Test Execution Results Evaluation Details
- E: Associated EOSDIS IV&V Technical Analysis Memoranda
- F: List of References
- G: Tools and Data Bases Utilized

Note:

- x*: 1, 2, 3, etc. As needed to discuss all *test_types* addressed in TAR.
- test_type*: Pre-Integration, Segment Integration, System Integration, Acceptance.

EOSDIS IV&V Technical Analysis Memorandum (TAM) Format

To: {cognizant person - usually the applicable NASA manager}

From: EOSDIS IV&V Team

Subject: {the topic of this TAM}

1. **Context** - {describe the specific configuration(s)/area(s)/document(s)/etc. affected}

2. **Discussion** - {discuss specific concerns(s)/reason(s) - what/why - for writing this}

3. **Recommendations** - {what do you suggest needs to be done - who/what/why}

4. **Recommended Distribution** - {who else should receive this - organization/name}

Originator:

Approved:

{typed name}
EOSDIS IV&V Analyst

{typed name}
EOSDIS IV&V Task Lead

Appendix D: List Of References

IV&V Documents

- | | |
|----------------------|---|
| [1] Deliverable 0301 | EOSDIS Independent Verification and Validation (IV&V) Management Plan, December 2, 1994 |
| [2] Deliverable 0302 | Independent System Verification and Validation Plan (ISVVP), December 15, 1994 |

ECS Documents

- | | |
|---------------------|--|
| [3] 101-101-MG1-001 | Project Management Plan for the EOSDIS Core System, July 1993 |
| [4] FB9403V4 | Release Plan Content Description (White Paper), September 1994 |
| [5] 194-201-SE1-001 | Systems Engineering Plan for the ECS Project, June 1994 |
| [6] 194-301-DV1-002 | System Implementation Plan for the ECS Project, June 1994 |
| [7] 304-CD-001-001 | Flight Operations Segment Requirements Specification for the ECS Project, Volume 1: General Requirements, November 1994 |
| [8] 304-CD-004-001 | Flight Operations Segment Requirements Specification for the ECS Project, Volume 2: Mission Specific, November 1994 |
| [9] 304-CD-002-001 | Science and Data Processing Segment (SDPS) Requirements Specification for the ECS Project, January 1995 |
| [10] 304-CD-003-001 | Communications and System Management Segment (CSMS) Requirements Specification for the ECS Project, December 1994 |
| [11] 305-CD-001-002 | Flight Operations Segment (FOS) Design Specification and FOS Database Design and Database Schema Specifications, January 1995 (Combined with 311-CD-001-002) |
| [12] 305-CD-002-001 | Science and Data Processing Segment (SDPS) Design Specification for the ECS Project, January 1995 |

- [13] 305-CD-003-001 Communications and System Management Segment (CSMS) Design Specification for the ECS Project, December 1994
- [14] 307-CD-001-001 Flight Operations Segment (FOS) Release and Development Plan for the ECS Project, January 1995 (Combined with 329-CD-001-002)
- [15] 307-CD-002-001 Science and Data Processing Segment Release and Development Plan for the ECS Project, January 1995 (Combined with 329-CD-002-001)
- [16] 307-CD-003-001 Communications and Systems Management Segment (CSMS) Release and Development Plan for the ECS Project, February 1995 (Combined with 329-CD-003-001)
- [17] 308-CD-001-003 Software Development Plan for the ECS Project, December 1994
- [18] 319-CD-001-002 Flight Operations Segment (FOS) Integration and Test Plan for the ECS Project, January 1995
- [19] 319-CD-002-001 Science and Data Processing Segment (SDPS) Integration and Test Plan for the ECS Project, Volume 2:Release A, January 1995
- [20] 319-CD-004-002 CSMS Integration and Test Plan for the ECS Project, Volume 2: Release A, March 1995
- [21] 402-CD-002-002 System Integration and Test Plan for the ECS Project, Volume 2: Release A, February 1995

Appendix E: Tools And Data Bases Utilized

Task 6 activities will utilize a number of tools during the analysis and evaluations of ECS Release A products and processes. Table E-1 provides a brief subset of the tools described in the Independent System Verification and Validation Plan (ISVVP) [2] which will support Task 6.

Tool	Utilization
RTM	Analyze requirements and traceability to tests and design using exports from ECS contractor.
ClearCase	Evaluate software development (builds/releases) and configuration management activities.
Automated Requirements Database (ARDB)	Maintain requirement evaluations, tailored also to support CARA effort.
Issue/Discrepancy Handling System (IDHS)	Store and maintain IR-1 issues and discrepancies.
Mosaic/NetScape	Access EDHS and download necessary files.
Microsoft Project	Provide task schedules

EXHIBIT E-1: Tools to be Utilized During ECS Release A Development Analysis

Appendix F: List Of Acronyms

CARA	Criticality Analysis And Risk Assessment
CERES	Clouds and Earth's Radiant Energy System
CI	Configuration Items
CSCI	Computer Software /Configuration Item
CSMS	Communication and System Management Segment
CSR	Consent To Ship Review
DAAC	Data Analysis and Archive Center
DPS	Data Processing Subsystem
ECS	EOSDIS Core System
EDHS	ECS Data Handling System
ESN	EOSDIS Science Network
ETR	Element Test Review
FOS	Flight Operations Segment
FTs	Functional Threads
GSFC	Goddard Space Flight Center
HAIS	Hughes Applied Information Systems
I&T	Integration and Test
IDHS	Issue Discrepancy Handling System
IR-1	Interim Release 1
IRVVP	Independent Release Verification and Validation Plan
ISVVP	Independent System Verification and Validation Plan
IV&V	Independent Verification And Validation
L0	Level 0
LOR	Level 0R data (Landsat)
L1	Level 1
LAN	Local Area Network
LaRC	Langley Research Center
LIS	Lightning Image Sensor
MSFC	Marshall Space Flight Center
PDR	Preliminary Design Review
PR	Precipitation Radar
SDPF	Sensor Data Processing Facility (GSFC)
SDPS	Science and Data Processing Segment
TAM	Technical Analysis Memorandum
TAR	Technical Analysis Report
TBD	To Be Determined
TMI	TRMM Microwave Image
TRMM	Tropical Rainfall Measurement Mission
TSDIS	TRMM Science Data and Information System
VIRS	Visible Infrared Scanner (TRMM)
WAN	Wide Area Network